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COTTAGER'S SELF HELP PROGRAM

ENRICHMENT STATUS OF LAKES

IN THE SOUTHEASTERN REGION

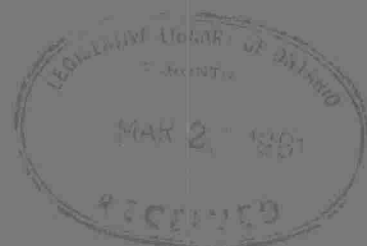
OF ONTARIO

1980



Ontario

**Ministry
of the
Environment**



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KWCC
Lakes - Southeastern
Region

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SOUTHEASTERN REGION
OF
ONTARIO
1980

Technical Support Section
Ministry of the Environment

COTTAGERS' SELF HELP PROGRAM

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ABSTRACT

The many thousands of lakes scattered throughout the vacation areas of our Province are a priceless heritage. No two of them are exactly alike. Some are deep and clear while others are naturally shallow and weedy. Some lakes, however, may become overgrown with weeds and noxious algae as a result of excessive nutrient inputs from ill conceived or poorly planned land use activities within their watersheds. Water quality data are required to formulate sound management strategies for our lakes.

In 1970, the Ministry of the Environment undertook to inventory the nutrient enrichment (trophic) conditions of recreational lakes in Ontario. This undertaking has been greatly assisted by members of the public who volunteer their time to take water clarity measurements and collect water samples for determination of their algae content as reflected by chlorophyll concentrations from lakes on which they are situated; hence the name Self Help Program.

This report presents data collected from lakes in Southeastern Region of Ontario by Self Help Program participants during 1980. In general most of our lakes are in very good condition from a recreational point of view. For a few lakes, however, the results indicated there is a sufficient abundance of algae to restrict recreational use of their water.

A noticeable improvement in water quality has been documented in Moira Lake following improved treatment of municipal sewage from the Village of Madoc in 1973. A progressive increase in chlorophyll concentrations has been documented in Mackie Lake. Additional studies are being completed on Mackie Lake to assess if there has been a change in the abundance or species of algae in its waters.

Many lakes have been included in the Self Help Program for a number of years now and a meaningful data base is beginning to be developed. It is apparent that although algae growth is related to nutrient inputs, it also varies in intensity seasonally in some lakes and varies annually with climatic conditions and other factors. These variations will be understood only with the long term data now being accumulated.

ACKNOWLEDGEMENT

The author of this report, D.L. Galloway, greatly acknowledges the assistance of the numerous cottagers, lakeside residents, staff of the Ministry of Natural Resources and the Ministry of the Environment, and the staff and students of Sharbot Lake High School who volunteered their time to undertake water clarity readings and water samplings for the 1980 Self Help Program. Their efforts represent a significant contribution to the understanding of water quality variables in the recreational lakes of our Province.

INTRODUCTION

Ontario has some 250,000 inland lakes and borders on four of five Great Lakes. An increase in leisure time, growing affluence, and the easy accessibility of lakes in vacation areas of South Ontario to urban centres of population has resulted in the extensive development of our lakes with summer cottages. In addition, many thousands of tourist and vacationers spend weekends and holidays at waterfront resorts and campgrounds.

Unfortunately, increased development and activity within the watershed of a lake can result in changes within the lake itself. One of those changes is an increase in the rate of supply of nutrients, principally phosphorus and nitrogen, to the lake. These nutrients act as fertilizers. They promote an increase in the growth and abundance of aquatic plants and algae in the lake. Aquatic plants and algae are primary producers; they convert the radiant energy of sunlight to the chemical energy of plant tissue which serves as a nutritional base for organisms which feed in and upon the lake. Increased primary productivity gives rise to increased numbers of organisms at all levels of the aquatic food chain up to and including fish. The overall increase in the biological productivity of a lake by the nutrient enrichment of its water is scientifically referred to as eutrophication.

A certain amount of nutrient enrichment is beneficial in terms of fish production. However, the symptoms of eutrophication generally spell a decline in the aesthetic and recreational attractiveness of a lake. Excessive growths of rooted aquatic weeds interfere with the use of nearshore areas for swimming and boating; while increasing concentrations of algae in the water cause taste and odour problems in domestic supply systems and cause the lake to become progressively more turbid with a corresponding reduction in water clarity.

Nutrients are present in the lake naturally; they reach the lake directly by precipitation on the lake, by surface water runoff from the surrounding land area, and by exchange from the lake bottom sediments. Nutrients also reach the lake as a result of human activities; sewage discharges, septic tank - tile field leachate, drainage from agricultural and forestry operations, and increased concentrations in runoff water as a result of construction and recreational activities associated with shoreline development in the watershed.

The response of a lake to man made nutrient inputs depends on their significance relative to the natural nutrient supply and also on the size and configuration of the basin of a lake which may concentrate the nutrients it receives and give dimension to biological activity. Not all lakes are equally capable of supporting an increasing number of people and their recreational activities. For some forested watersheds where the principle land use activity is recreational, the major controllable source of nutrients may be shoreline development. It may be necessary to limit the extent and nature of shoreline development on some lakes in order to protect their water quality.

In 1971, the Ministry of the Environment introduced a Self Help Program to enlist the assistance of cottagers and other concerned public to assess the trophic or nutrient enrichment status of recreational lakes in the Province. This report presents water quality data for 99 lakes enrolled in a Self Help Program in the Southeastern Region of Ontario in 1980 and comments on the degree of nutrient enrichment or trophic status of 79 lakes for which data was obtained on at least six or more occasions during the year. The Southeastern Region includes Hastings and Renfrew Counties and extends eastward to the Quebec border.

The Ministry of the Environment publication Cottage Country provides a further explanation of water quality problems of recreational lakes. Copies are available to the public without charge from any Ministry of the Environment office.

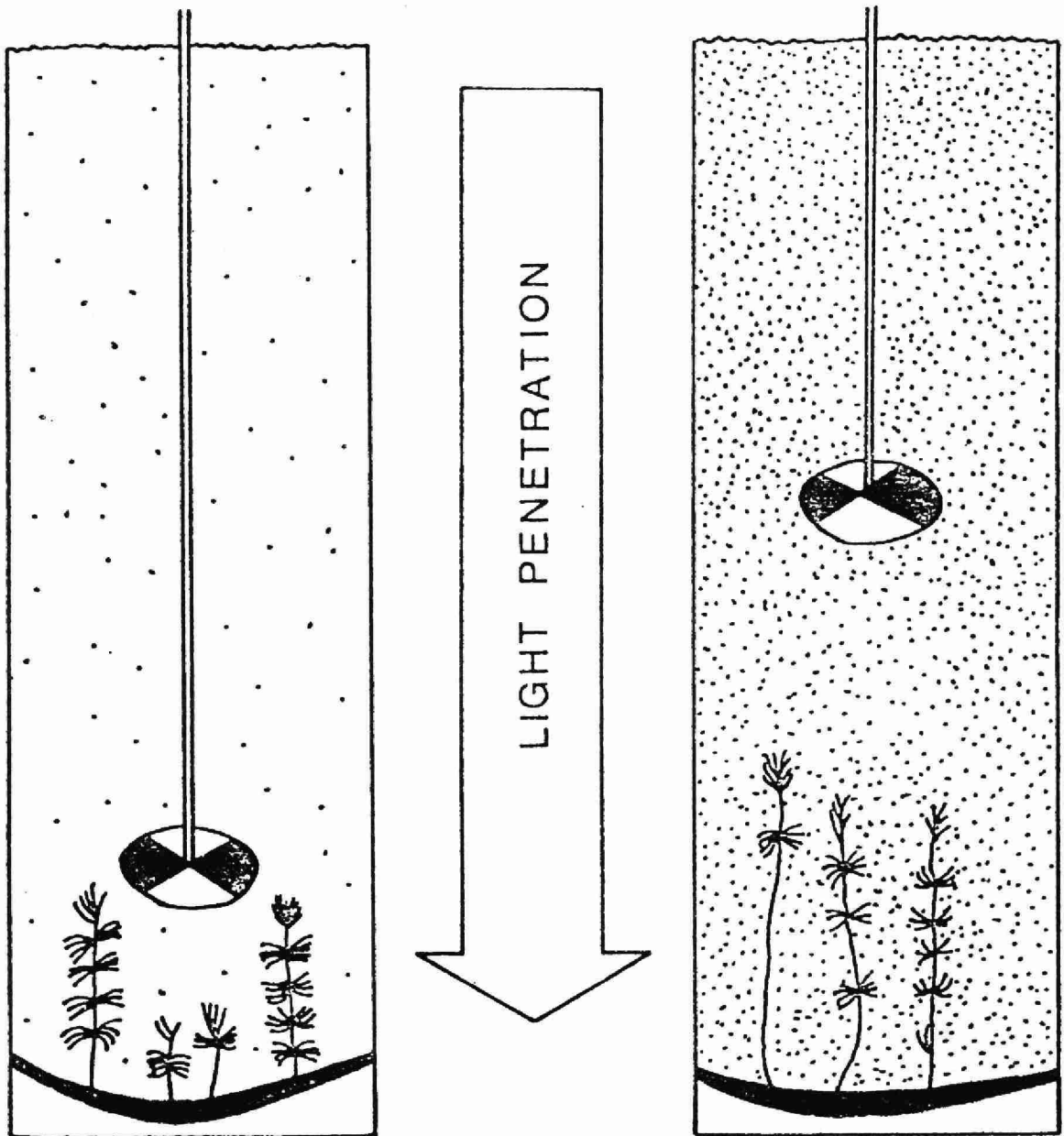


Figure 1: Diagram illustrating the use of a Secchi disc to measure water clarity. Greater visibility characterizes clear lakes having low algal densities (left panel) than productive lakes which contain high algal levels and have low light penetration (right panel).

METHODS

Water clarity is one of the most important characteristics of a lake from a recreational point of view. Secchi disc visibility depth is one of the simplest and most commonly made measurements of water quality. A Secchi disc is a circular steel plate 20 centimetres (8 inches) in diameter painted in an opposing black and white quadrants (Figure 1). The depth at which it disappears from view when lowered vertically into the water is a measure of the water clarity of a lake.

Water clarity is affected by the amount of phytoplankton (microscopic algae which inhabit the water of lake). Increasing amounts of phytoplankton in a lake causes the water to become progressively more turbid and water clarity declines as a result. The amount of algae in a unit of water may be determined by placing an aliquot under a microscope and enumerating the individual cells or algal colonies present. This is a time consuming, tedious procedure and requires special collecting and concentrating techniques. A simpler method is to chemically measure the amount of green pigment, chlorophyll a, in the water. Chlorophyll a is a component of all green plants. The amount of chlorophyll a in a sample of water is a measure of the amount of phytoplankton in the lake at the time of sampling.

Volunteers who contacted the Ministry of the Environment to assist in a Self Help Program were provided with a Secchi disc, a water sampling device, bottles, detailed sampling instructions and return shipping material. Samplers were instructed to undertake water clarity measurements at a central or open water location on their lake at weekly or bi-weekly intervals during the ice free season, depending upon their availability at the lake.

The depth at which algae cease to grow in a lake owing to insufficient light to sustain photosynthesis is approximated by twice the Secchi disc depth visibility. Water samples were collected at the same time as water clarity measurements by lowering a narrow mouthed 1 litre bottle in a weighted sampler to the lower limit of the zone of phytoplankton growth as determined by doubling the Secchi disc depth measurement. The speed of lowering and raising the sampler was regulated by trial and error repetition so that the

bottle just filled as it ascended to the surface. In this manner, a composite sample equally representative of all depths from the measured water column was collected. The samples were preserved immediately after collection with 0.5 ml (5 drops) of one half percent magnesium carbonate suspension to minimize degradation of chlorophyll pigment and were delivered as soon as possible, usually within a day or two, to a Ministry of the Environment Laboratory via COD shipment.

Water samples were filtered using 1.2 micron filter paper, the residue extracted with 90 percent acetone and the chlorophyll concentration determined spectrophotometrically according to standard methods of the Ministry of the Environment Laboratory Services Branch.

Table 1: Lakes in the Southeastern Region of Ontario that were sampled in 1980 as part of the Cottager's Self-Help Program.

<u>LAKE</u>	<u>COUNTY(S)</u>	<u>TOWNSHIP(S)</u>
1. Albion	Hastings	Faraday
2. Ashby	Lennox & Addington	Ashby
3. Baptiste	Hastings	Herschel
4. Bark	Renfrew, Hastings, Nipissing District	Jones, Bangor, Lyell, Wicklow
5. Bass	Leeds	Rear of Leeds & Lansdowne
6. Beaver	Frontenac	Olden
7. Bellamy	Leeds	Bastard, Kitley
8. Bennett	Lanark	Bathurst
9. Big Gull (Clarendon)	Frontenac	Clarendon, Barrie
10. Big Rideau	Lanark, Leeds	North Burgess, North Elmsley, South Burgess, South Elmsley
11. Black	Frontenac	Olden
12. Black	Lanark	North Burgess
13. Bobs	Frontenac	Bedford
14. Boulter	Hastings	McClure
15. Brule (Wensley)	Frontenac	Miller
16. Buck - North Bay	Frontenac	Loughborough, Bedford, Storrington
17. Buckshot	Frontenac	Miller
18. Burr ridge	Frontenac	Bedford
19. Carson	Renfrew	Jones, Sherwood
20. Cashel	Hastings	Cashel
21. Cedar	Frontenac	Kennebec
22. Charleston	Leeds	Rear of Yonge and Escott, Rear of Leeds & Lansdowne
23. Chippego	Frontenac	Hinchinbrooke

<u>LAKE</u>	<u>COUNTY(S)</u>	<u>TOWNSHIP(S)</u>
24. Christie	Lanark	Sherbrooke, Bathurst
25. Clayton	Lanark	Ramsay, Lanark
26. Clear	Renfrew	Sebastopol
27. Collins Bay	Frontenac	Kingston
28. Colton	Renfrew	Admaston
29. Constan (Constant)	Renfrew	Grattan
30. Cranberry	Frontenac	Storrington
31. Crosby	Leeds	North Crosby
32. Cross (Crotch)	Frontenac	Palmerston
33. Crow	Frontenac	Bedford
34. Crowe	Hasting, Peterborough	Marmora, Belmont
35. Dalhousie	Lanark	Dalhousie
36. Dempseys (Virgin)	Renfrew	Bagot, Blythfield
37. Desert	Frontenac	Loughborough
38. Devil	Frontenac	Bedford
39. Diamond	Hastings	Herschel
40. Dickey	Hastings	Lake
41. Dog (Little Dog)	Frontenac	Storrington
42. Dore	Renfrew	Wilberforce
43. Duncan	Frontenac	Hinchinbrooke
44. Dutch (Clark)	Frontenac	Kennebec
45. Eagle	Frontenac	Hinchinbrooke
46. Farren (Farrell)	Lanark	South Sherbrooke
47. Gananoque	Leeds	Rear of Leeds & Lansdowne Front of Leeds & Lansdowne
48. Glanmire	Hastings	Tudor
49. Golden	Renfrew	North Algona
50. Green	Renfrew	Brougham
51. Grindstone	Frontenac	Clarendon, Miller

<u>LAKE</u>	<u>COUNTY(S)</u>	<u>TOWNSHIP(S)</u>
52. Grippen	Leeds	Rear of Leeds & Lansdowne
53. Gunter	Hastings	Cashel
54. Hambly (Silver)	Frontenac	Portland
55. Hay Bay	Lennox & Addington	Fredericksburgh
56. Horseshoe	Frontenac	Kennebec
57. Indian	Leeds	South Crosby
58. Joeperry	Lennox & Addington	Effingham
59. Kaminiskeg	Hastings, Renfrew	Bangor, Sherwood
60. Kashwakamak	Frontenac	Clarendon, Miller
61. Kennebec	Frontenac	Kennebec
62. Limerick	Hastings	Limerick
63. Loughborough	Frontenac	Storrington, Loughborough
64. Mackie	Frontenac	Miller
65. Mazinaw	Frontenac, Lennox & Addington	Abinger, Barrie
66. Miller	Frontenac	Olden
67. Mink	Renfrew	Wilberforce
68. Mississippi	Lanark	Drummond, Beckwith, Ramsay
69. Mosque	Frontenac	Miller, Clarendon
70. Olmsted (Jeffreys)	Renfrew	Ross
71. Opinicon	Frontenac, Leeds	Bedford, Storrington, South Crosby
72. Otter	Leeds	Bastard, South Elmsley
73. Otty	Lanark	North Burgess, North Elmsley
74. Palmerston	Frontenac	Palmerston, South Canoto
75. Patterson	Lanark	Dalhousie
76. Paugh	Renfrew	Burns, Sherwood
77. Pike	Lanark	North Burgess
78. Potspoon	Frontenac	Bedford

<u>LAKE</u>	<u>COUNTY(S)</u>	<u>TOWNSHIP(S)</u>
79. Red Horse	Leeds	Rear of Leeds & Lansdowne
80. Robertson	Lanark	Lavant
81. St. Andrews	Frontenac	Hinchinbrooke
82. St. George	Frontenac	Olden, Oso
83. St. Peter	Hastings	McClure
84. Salmon Trout	Hastings	Monteagle
85. Sand	Leeds	South Crosby
86. Sharbot	Frontenac	Olden
87. Silver	Frontenac, Lanark	Oso, South Sherbrooke
88. Skootamatta	Lennox & Addington	Anglesea
89. Smith	Renfrew	Head
90. Sydenham	Frontenac	Loughborough
91. Taylor	Lanark	Lanark
92. Temperance	Leeds	Rear of Yonge & Escott
93. Thirty Island	Frontenac	Bedford
94. Troy	Leeds	South Crosby
95. Verona (Rock)	Frontenac	Portland
96. Watson	Frontenac	Olden
97. White	Lanark, Renfrew	Darling, Bagot & McNab
98. Whitefish	Leeds	South Crosby, Rear of Leeds & Lansdowne
99. Wollaston	Hastings	Wollaston

RESULTS & DISCUSSION

Ninety-nine lakes were enrolled in the 1980 program (Table 1). The enrollment consisted of 27 "new lakes" and 72 that were carried over from the program in 1979. The lakes ranged in size from less than 10 hectares to 4,700 hectares. The range of other physical characteristics, shape, depth, water renewal rate, and so on also varied greatly. Lakes were scattered throughout Southeastern Ontario with the majority located within the Precambrian Shield, a geological formation that embraces the northern two-thirds of the Region.

The mean Secchi disc visibility depths and mean chlorophyll concentrations for 79 lakes (84 basins) with six or more sets of measurements each are summarized in Table 2. Individual results for each sampling date for all 99 lakes are presented in Table 4. Some lakes are represented by more than one sampling site. This is necessary for lakes divided into two or more distinct basins (Loughborough, Sharbot) or that are comprised of a number of bays (Bobs, Mosque) which may act independently from a water quality point of view, and is desirable for large irregularly shaped lakes (Baptiste, Desert) where regional differences in water clarity and phytoplankton density might be expected to occur.

The results indicate that algal growths vary in intensity in some lakes at different seasons of the year. Ashby, Burr ridge, Charleston and Kennebec, for example, attain their highest chlorophyll concentrations during spring and early summer while a number of other lakes including Christie, Clayton, Clear, Crosby and Opinicon experienced their maximum productivity and poorest water clarity later in the year.

Since the frequency and regularity of sampling can thus affect mean chlorophyll concentrations and mean Secchi disc visibility depths, discretion is required in comparing some lakes. In a number of cases, sampling was completed during the summer months only, and the presence or absence of higher phytoplankton levels and reduced water clarity during the spring and fall can not be confirmed. No attempt at all should be made to define the nutrient enrichment status of lakes for which less than six sets of measurements were completed. These lakes are omitted from Table 2 and from the remainder of the report for comparative purposes.

Table 2: Means for Secchi disc visibility depths (metres) and chlorophyll concentrations (micrograms per litre) for 79 lakes (84 basins) with 6 or more sets of data in the Southeastern Region of Ontario during 1980. Number of measurements used in the derivation of the means is also presented. When a different number of Secchi and chlorophyll measurements were available, the number of Secchi measurements is presented first.

LAKE		Secchi (m)	Chloro. (ug/l)	No. of Samples
1.	Albion	3.7	2.7	9
2.	Ashby	5.9	1.7	11
3.	Baptiste	3.5	3.0	16
5.	Bass	6.5	2.1	9
8.	Bennett	3.1	4.6	6
11.	Black	4.7	2.1	8
13.	Bobs			
	a) Buck Bay	3.7	4.5	6
	b) Crow Bay	3.9	2.9	9, 8
	c) Mud Bay	3.5	4.9	12, 11
	d) Western Basin	3.2	2.7	13
14.	Boulter	3.1	3.6	6
15.	Brule	6.8	1.4	12
16.	Buck North Bay	3.8	3.1	31
18.	Burridge	4.4	2.4	17, 16
19.	Carson	5.3	2.0	14
20.	Cashel	5.8	1.4	12, 11
21.	Cedar	2.5	6.8	8
22.	Charleston	4.3	2.5	64, 63
23.	Chippago	3.1	5.2	22, 21
24.	Christie	4.7	3.3	8
25.	Clayton	3.6	2.9	11, 10
26.	Clear	4.2	2.4	24
27.	Collins Bay	2.8	5.4	6
28.	Colton	6.2	1.4	16, 15
29.	Constan	4.0	2.1	12
30.	Cranberry	2.2	9.4	12
31.	Crosby	4.0	2.6	12
32.	Cross	4.6	1.9	8
34.	Crowe	3.0	3.2	13
35.	Dalhousie	4.4	2.8	25
36.	Dempseys (Virgin)	4.2	2.4	6
37.	Desert	4.6	2.3	28, 27
39.	Diamond	4.3	1.3	9, 8
40.	Dickey	4.8	1.2	18, 17
41.	Dog (Little Dog)	1.2	22.8	8
42.	Dore	4.4	3.0	7
43.	Duncan	2.6	2.6	8
45.	Eagle	4.8	2.9	24, 27
46.	Farren	4.7	2.1	11, 10
47.	Gananoque	1.8	5.3	13

LAKE		Secchi (m)	Chloro. (ug/l)	No. of Samples
49.	Golden	3.7	2.6	8
50.	Green	8.9	1.1	13
52.	Grippen	3.8	4.0	13
53.	Gunter	3.6	2.0	17, 15
54.	Hambly (Silver)	4.0	6.9	7
55.	Hay Bay	1.0	19.9	14
57.	Indian	3.9	3.0	11
59.	Kamaniskeg	4.8	2.5	28
60.	Kashwakamak	2.6	2.1	12
61.	Kennebec	2.4	5.5	30
62.	Limerick	4.7	1.5	9, 8
63.	Loughborough			
	a) East Basin	3.2	5.1	16
	b) West Basin	4.8	2.5	11, 10
64.	Mackie	4.9	4.8	7
65.	Mazinaw	4.9	1.4	22, 21
66.	Miller	2.3	24.6	9
67.	Mink	4.1	3.5	6
69.	Mosque			
	a) main basin	5.8	1.6	12
70.	Olmsted	5.4	2.6	9, 8
71.	Opinicon	3.2	3.9	26, 25
72.	Otter	2.7	2.3	20
73.	Otty	4.5	2.7	24, 23
74.	Palmerston	8.4	1.5	13
76.	Paugh	5.2	1.5	7, 8
77.	Pike	3.8	4.3	20
78.	Potspoon	2.8	3.1	12
79.	Red Horse	3.4	6.1	16
80.	Robertson	5.9	3.4	14
81.	St. Andrews	1.8	10.5	21, 20
83.	St. Peter	3.2	2.2	13
84.	Salmon Trout	3.3	11.7	8, 7
85.	Sand	3.0	3.8	26
86.	Sharbot			
	a) East Basin	3.6	3.2	33, 36
	b) West Basin	4.3	2.4	8
87.	Silver	3.4	2.4	30
88.	Skootamatta	3.6	2.2	9, 8
90.	Sydenham	4.2	3.2	8
92.	Temperance	1.9	6.0	12
93.	Thirty Island	4.6	3.6	14
94.	Troy	2.3	6.7	20
95.	Watson	1.5	12.6	8
97.	White	2.7	5.3	40, 38
98.	Whitefish	2.6	4.3	22, 21
99.	Wollaston	5.4	1.2	5, 6

The most transparent lakes were Green (8.9 m), Palmerston (8.4 m), Brule (6.8 m), Bass (6.5 m) and Colton (6.2 m). Another eight lakes also had a mean Secchi disc visibility depth greater than 5 metres. The exceptional clarity of these lakes can be attributed to the sparceness of phytoplankton in their waters. Of the above group, only Bass Lake had a chlorophyll concentration greater than 2 $\mu\text{g/L}$.

Secchi disc depths between 3 and 5 metres characterize most of our recreational lakes, 53 in the 1980 program and are generally indicative of a moderate amount of phytoplankton. In this group, chlorophyll concentrations range from 1.2 $\mu\text{g/L}$ (Dickey Lake) to 11.7 $\mu\text{g/L}$ (Salmon Trout) with an average value of 3.2 $\mu\text{g/L}$.

Most lakes with a mean Secchi disc visibility depth less than 3 metres experience a reduction in their water clarity due at least in part to an abundance of phytoplankton in their water. The least transparent lakes were Hay Bay (1.0 m), Dog Lake (1.2 m), Watson (1.5 m), St. Andrews (1.8 m), Gananoque (1.8 m) and Temperance (1.9 m). All had chlorophyll concentrations greater than 5 $\mu\text{g/L}$. The basins of most of these lakes are situated in regions of Paleozoic bedrock of sedimentary origin and are surrounded by rich agricultural land, the drainage from which undoubtedly substantially contributes to their nutrient supply.

Lakes are classified on a continuing rising trophic (nutrient enrichment) scale according to their biological productivity. The biological productivity depends upon a variety of factors involving both aspects of the rate at which nutrients are supplied to the lake and the physical demensions of the lake itself.

The nutrient poor end of the trophic spectrum of lakes are termed oligotrophic. They are typically deep, clear water lakes with low concentrations of nutrients and very little biological productivity. At the nutrient rich end of the scale are eutrophic lakes. Most of these are shallow murky basins with high levels of nutrients and very productive waters. Mesotrophic lakes occupy an intermediate position between oligotrophic and eutrophic lakes. They are intermediate with respect to their nutrient concentrations, depth, biological productivity and water clarity.

Numerical criteria are useful to define this classification scheme. These typically involve total phosphorus concentrations, total nitrogen concentrations, chlorophyll a levels, Secchi disc depths and/or other water quality parameters. Chlorophyll concentrations, since they are regulated by a combination of physical, chemical and biological factors are widely accepted as one of the more integrative indices of lake trophic state.

Since changes from oligotrophy to eutrophy do not occur at sharply defined places, the divisions in trophic level are somewhat arbitrary and possibly of limited geographic applicability. The Ministry of the Environment trophic state - chlorophyll a classification scheme is presented below and compared to classification schemes used by the United States Environmental Protection Agency and the United States National Academy of Sciences.

Trophic Condition vs. Chlorophyll a

Trophic State	Chlorophyll <u>a</u> ($\mu\text{g/L}$)		
	Ontario Ministry of Environment	National Academy of Science	U.S. Environmental Protection Agency
Oligotrophic	0-2	0- 4	<7
Mesotrophic	2-4	4-10	7-12
Eutrophic	>4	>10	>12

Seasonal mean chlorophyll concentrations of lakes in the Self Help Program range from 1.1 $\mu\text{g/L}$ (Green Lake) to 24.6 $\mu\text{g/L}$ (Miller Lake) and thus encompass the entire range of trophic conditions normally encountered. None, however, approached the extremely enriched condition, for example, of certain small Canadian prairie lakes which commonly attain chlorophyll concentrations of 100 to 400 $\mu\text{g/L}$. Based on the MOE classification scheme, 17% were oligotrophic, 56% were mesotrophic and 27% were eutrophic. By the other two classification schemes, most of our lakes would have fallen in the oligotrophic category.

Some 17 lakes had a seasonal mean chlorophyll concentration greater than 5 $\mu\text{g/L}$. They may be sufficiently enriched with nutrients to experience intermittent algal "blooms". An algal bloom is a rapid proliferation of algae under extremely favourable conditions of nutrient enriched waters and a

prolonged period of warm, calm and sunny weather. Blooms are discernable visually by a green, blue-green or brown turbidity in the water. At concentrations greater than 15 to 20 $\mu\text{g/L}$, the frequency and severity of blooms may become increasing problematic and interfere with recreational and other beneficial uses of the lake. These higher levels of algae may also make it difficult for some types of fish to survive and result in a shift to less desirable species from an angling point of view.

Algal blooms are not entirely restricted to eutrophic lakes. There have been a few isolated occurrences of blooms on a few even oligotrophic lakes in our Region.

Some 61 lakes now have three or more consecutive years data collected through the Self Help Program (Table 3). This allows a comparison of water clarity and phytoplankton abundance between years within the lakes. Just as there is considerable variation in Secchi disc depths and chlorophyll concentrations within any one year, there is considerable annual variation as well. Annual variation may be due to cultural activities within the watershed that significantly alter the nutrient loading of the lake, for example shoreline development, large scale changes in forestry or agricultural operations or sewage disposal practices.

A case point is Moira Lake. The Village of Madoc (population 1,240) indirectly discharges municipal sewage to Moira Lake via Deer Creek. As part of a Provincial policy to reduce nutrient inputs to Ontario's lakes and rivers, seasonal retention and phosphorus removal facilities became operational at Madoc in 1973. The lagoons are only discharged in the Spring and Fall when there is adequate stream dilution and before or after the growing season for aquatic plants. Seasonal mean chlorophyll concentrations immediately declined from 26 $\mu\text{g/L}$ to 10.4 $\mu\text{g/L}$. The reduced chlorophyll concentration appears to have persisted with a corresponding improvement in water quality in Moira Lake. The situation in Moira Lake parallels similar improvements in water quality that have been observed in the Lower Great Lakes and in the Bay of Quinte as a result of municipal pollution controls implemented during the past decade.

Table 3: Mean values for Secchi disc visibility depths (metres) and chlorophyll a concentrations (micrograms per litre) for lakes in the Southeastern Region of Ontario with three or more years of 6 sets of measurements each available.

LAKE	1980		1979		1978		1977		1976		1975		1974		1973		1972	
	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.
Adams					4.3	3.9	3.9	3.2	4.1	3.4								
Ashby	5.9	1.7	5.6	1.4	6.4	1.5	6.8	1.3										
Baptiste	3.5	3.0	4.5	1.8	4.3	1.6	3.6	2.4			3.2	2.1						
Bass	6.5	2.1	4.7	1.7	5.9	1.5	6.6	1.0										
Big Gull					4.6	2.0	4.6	2.0	4.6	2.1								
Big Rideau			4.4	2.3	4.5	2.0	4.0	1.4	4.1	2.3	4.5	1.6						
Black	4.7	2.1	5.2	1.5	4.9	1.6	5.0	1.3	4.1	1.4								
Bobs -Buck Bay	3.7	4.5	3.6	3.3	3.4	3.0	3.8	3.5	4.8	2.6								
Boulter					4.0	1.4	4.0	1.0	3.7	1.5								
Buck -North Bay	3.8	3.1	3.5	4.0	3.9	3.3	3.5	2.3										
Carson	5.3	2.0	5.7	1.8	6.2	1.9	6.3	1.3										
Charleston	4.3	2.5	3.9	2.5	3.8	2.4	4.0	2.2	4.9	2.9								
Christie	4.7	3.3	4.4	4.1	4.8	2.8	4.4	3.9	4.3	2.8								
Clear	4.2	2.4	4.2	1.7			3.5	1.8										
Collins Bay	2.8	5.4	3.0	6.4	3.2	4.1	3.3	3.2	2.8	3.5	2.8	4.2						
Cranberry	2.2	9.4	2.1	9.2	1.6	12.4	2.2	7.6										
Crowe	3.0	3.2	2.4	3.2	2.4	2.1	4.8	2.2	4.7	3.3			4.7	1.2			3.8	1.7
Dalhousie	4.4	2.8	3.4	1.9	4.6	1.4	4.1	1.6	3.9	2.3								
Desert	4.6	2.3	4.5	2.0	5.5	1.7	4.9	1.7										
Devil					5.3	1.9	4.8	1.7	5.2	1.5	5.1	2.0	5.7	1.6				
Diamond	4.3	1.3	4.9	1.3	5.1	1.0												

LAKE	1980		1979		1978		1977		1976		1975		1974		1973		1972	
	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.
Dore	4.4	3.0	4.7	2.2	4.5	2.5	4.8	2.0										
Eagle	4.8	2.9	4.7	2.2			4.3	1.3										
Gananoque	1.8	5.3	3.2	3.1	3.0	4.7	2.2	3.1										
Garskeys (Ellens)			3.4	3.0	3.5	3.2	3.5	2.2										
Glanmire			3.6	3.4	3.7	3.0	3.4	1.9	3.2	2.3	3.6	---						
Green	8.9	1.1	7.9	1.6	8.0	0.8	8.3	0.7	8.5	1.6								
Grippen	3.8	4.0	2.9	2.5	3.2	3.1	2.7	2.1	3.9	3.1	2.9	2.6						
Hay Bay	1.0	19.9	1.2	16.6	1.5	12.1	1.1	16.6										
Hurds			4.4	2.9	4.5	2.2	4.7	2.1			4.8	1.7						
Joeperry			3.8	2.5	4.2	2.5	4.3	1.6										
Kamaniskeg	4.8	2.5	4.5	1.7	4.6	2.2	5.1	1.4	4.5	1.2								
Kennebec	2.4	5.5	3.2	2.4	3.5	2.2	3.7	1.9	4.1	2.7								
Limerick	4.7	1.5	4.4	1.4	4.9	1.3	4.7	1.5	4.7	1.0	5.0	1.1						
Little Silver			4.0	4.6	5.1	2.6	4.2	5.0										
Loughborough																		
East Basin	3.2	5.1	3.3	3.6	3.0	3.6	2.8	3.7	3.4	2.1	2.3	4.9	2.7	2.7	3.3		3.1	2.6
West Basin	4.8	2.5	4.0	2.0	3.9	1.8	3.4	2.2	4.5	2.5	4.1	2.1			4.0			
Mackie	4.9	4.8	6.7	4.6	6.1	2.5	6.3	1.8	6.0	1.3					6.6	0.5		
Mazinaw	4.9	1.4	5.2	1.4	5.6	1.0	5.7	1.2	5.6	1.2	5.6	1.0						
Mink	4.1	3.5	4.2	1.4	4.3	1.6	3.5	1.5	3.6	1.8	3.8	1.8						
Mississippi			3.9	2.1	3.4	1.8							3.6	2.0	4.3	2.2		

LAKE	1980		1979		1978		1977		1976		1975		1974		1973		1972	
	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.
<hr/>																		
Moir																		
West Basin			1.9	6.5							1.6	11.9	1.7	9.3	1.6	10.4	1.1	26.0
East Basin					2.0	8.0	2.0	7.2							2.1	9.2		
Mosque																		
N.W. Basin			4.6	3.2	4.5	3.7	3.9	2.9										
Main Basin	4.8	1.6	5.5	1.4	5.7	1.5	5.1	1.7										
Muskrat			2.4	7.1	2.7	6.6	1.7	10.3										
Olmsted	5.4	2.6	6.3	1.2	6.6	1.3	6.3	1.4										
Opinicon	3.2	3.9	3.3	3.7	3.0	3.6	2.8	2.6										
Otter	2.7	2.3	3.1	2.3	3.3	2.0	3.0	2.1	3.2	2.4	3.2	1.4						
Otty	4.5	2.7	4.4	2.1	4.2	2.1	4.0	1.7	4.5	1.8	4.5	1.8	3.8	1.1	4.1	1.9		
Palmerston	8.4	1.5	8.8	1.6	8.2	1.4	7.1	1.6										
Pike	3.8	4.3	3.7	4.0	4.2	2.8	3.1	4.0	2.4	4.4								
St. Peter	3.2	2.2	3.5	2.0					3.6	1.9								
Salmon Trout	3.3	11.7	3.2	7.4	4.2	5.0			3.4	6.6			3.7	1.4				
Sharbot																		
East Basin	3.6	3.2	3.1	2.0	2.8	1.9												
West Basin	4.3	2.4	4.4	1.9	4.8	1.8	4.2	1.7	4.1	2.0								
Silver	3.4	2.4	4.1	2.0	3.5	1.8	3.5	1.6										
Steenburg			4.5	2.1	4.2	2.0	4.7	2.0	4.3	1.3								
Sydenham	4.2	3.2	3.6	3.0	3.6	2.1	5.0	3.4										
Tait													4.2	4.0	4.1	1.5	5.6	0.9

LAKE	1980		1979		1978		1977		1976		1975		1974		1973		1972	
	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.	SD	chl.
Temperance	1.9	6.0	2.6	3.1	2.2	2.8	1.2	8.9	1.9	7.7								
Thirty Is.	4.6	3.6	4.6	1.7	5.0	2.2	5.0	2.6										
Troy	2.3	6.7	2.0	8.0	1.9	7.4	1.7	6.9										
White	2.7	5.3	3.0	3.0	3.2	3.7	2.8	3.6	2.3	6.4	3.1	3.5	3.0	2.2	2.6	4.2	1.8	4.8
Whitefish	2.6	4.3	3.0	2.6	2.7	3.4	2.6	4.4										
Overall																		
Mean	4.05	3.83	4.01	3.24	4.20	2.92	4.05	2.97	4.15	2.65	3.76	2.91	3.68	2.83	3.63	4.27	3.08	7.20

Seasonal mean chlorophyll concentrations have continuously risen in Mackie Lake since 1976. There is no apparent explanation for this phenomenon. In addition to the routine samples that were collected for chlorophyll analyses, samples were also collected this year for identification and enumeration of phytoplankton to assess whether there has been any actual change in the phytoplankton community of Mackie Lake. Mackie Lake was also visited during 1980 by Ministry of the Environment Recreational Lake Survey field crews to evaluate other in water quality parameters. The results are presently being analyzed.

In most other cases the annual variation of mean Secchi disc visibility depths and chlorophyll concentrations are relatively minor and can likely be attributed to year to year variations in sunshine, temperature, rainfall, and flushing rates within watersheds.

CONCLUSIONS & RECOMMENDATIONS

The information on water clarity and phytoplankton levels obtained through the Cottagers' Self Help Program to date indicate that most of our inland lakes are in excellent condition from a water quality point of view. There are only a few lakes where chlorophyll concentrations are sufficiently high to suggest that excessive amounts of algae or other symptoms of advancing eutrophy might interfere with recreational use. In most cases the productivity of those lakes is largely a reflection of the fertility of the surrounding land area from which they receive drainage and runoff.

It would be desirable to determine if any trends towards advancing or lessening eutrophication were occurring. This would permit an assessment of the effectiveness of corrective measures to reduce nutrient inputs and similarly permit preventive measures such as restrictive land use zoning and other restrictions on shoreline or waterfront development to be imposed as required. Limnology is a relatively young science. Very few lakes have been studied long enough to determine their year to year or perhaps decade to decade variability. With relatively few exceptions, it is difficult to determine if three or five or more consecutive years measurements merely represent fluctuations about a stable long term average condition or whether lakes may perhaps be undergoing a gradual shift in trophic level on a broader scale. Monitoring trophic parameters such as chlorophyll a and Secchi disc depth on a continuing basis appears to be the best method at present to address this question.

The Ministry of the Environment does not have the physical or logistical resources to undertake this kind of surveillance operation on its own. The volunteer assistance of the public in the acquisition of water quality data, such as through the Self Help Program, is required.

Participants in the Self Help Program are therefore invited to consider the continuation of their sampling in 1981 and following. The Ministry of the Environment also welcomes inclusion of lakes not presently enrolled in the Self Help Program. The Self Help Program provides an opportunity not only for an annual assessment of the trophic status of a lake, but also provides a

mechanism to advise cottage associations about the causes and effects of eutrophication. For further information and assistance in establishing a Self Help Program, write to: Self Help Program, Ontario Ministry of the Environment, P.O. Box 820, 133 Dalton Street, Kingston, Ontario, K7L 4X6, (Telephone 613-549-4000).

Table 4: Secchi disc visibility depths (metres) and chlorophyll a concentrations (micrograms per litre) data collected from 99 lakes in the Southeastern Region of Ontario during the summer of 1980. Mean and standard deviation values are also presented.

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
1. <u>Albion</u>	Jun 8	2.6	4.0
	22	3.4	3.8
	Jul 1	5.5	1.7
	6	3.5	2.5
	15	3.2	2.4
	27	3.2	1.5
	Aug 4	3.4	3.9
	10	4.0	3.2
	Sep 8	<u>4.3</u>	<u>1.7</u>
	MEAN	3.68	2.74
	STANDARD DEVIATION	0.84	1.01
2. <u>Ashby</u>	May 19	5.5	2.2
	Jun 8	5.5	2.3
	Jul 1	4.6	1.9
	13	5.5	1.7
	27	5.5	1.3
	Aug 4	5.6	1.9
	17	6.7	1.7
	Sep 1	6.1	1.1
	Oct 12	6.7	1.1
	14	6.7	1.8
	28	<u>6.1</u>	<u>1.5</u>
	MEAN	5.86	1.68
	STANDARD DEVIATION	0.66	0.40
3. <u>Baptiste</u> #1	May 23	3.5	2.8
	Jul 3	4.1	2.2
	11	3.2	2.8
	31	3.5	11.8
	Aug 2	3.5	2.0
	25	3.4	2.4
	Sep 5	3.4	3.0
	Oct 17	<u>3.2</u>	<u>2.2</u>
	MEAN	3.48	3.65
	STANDARD DEVIATION	0.28	3.31
<u>Baptiste</u> #2	May 23	3.7	3.1
	Jul 3	3.4	2.3
	11	3.4	3.0
	31	3.7	0.9
	Aug 2	4.1	2.1
	25	3.5	2.6
	Sep 5	3.8	2.8
	Oct 17	<u>3.0</u>	<u>2.1</u>
	MEAN	3.58	2.36
	STANDARD DEVIATION	0.33	0.70

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
4. <u>Bark</u>	Jul	11	3.0	1.6
	Aug	21	6.5	1.9
	Sep	3	3.8	1.5
		18	4.5	1.5
	Oct	3	<u>5.0</u>	<u>1.0</u>
	MEAN		4.56	1.50
	STANDARD DEVIATION		1.32	0.32
5. <u>Bass</u>	Jul	13	5.2	2.1
		20	5.8	1.7
		26	5.8	1.7
	Aug	10	6.7	3.6
		10	7.3	1.9
		17	8.2	2.2
		25	7.3	2.4
	Sep	1	7.3	1.8
		7	<u>4.6</u>	<u>1.2</u>
	MEAN		6.47	2.07
	STANDARD DEVIATION		1.18	0.67
6. <u>Beaver</u>	Jun	19	1.4	---
	Jul	9	3.7	9.7
		30	1.4	---
	Aug	7	1.4	17.7
		13	3.7	21.4
	Sep	7	<u>1.4</u>	<u>15</u>
	MEAN		2.17	15.95
	STANDARD DEVIATION		1.19	4.92
7. <u>Bellamy</u>	May	25	1.8	1.9
	Jun	1	2.1	1.6
		22	1.8	3.0
	Aug	4	<u>1.8</u>	<u>12.8</u>
	MEAN		1.88	4.83
	STANDARD DEVIATION		0.15	5.35
8. <u>Bennett</u>	Jun	22	2.9	4.5
	Jul	27	2.9	5.5
		27	3.4	4.2
	Aug	10	2.9	4.9
		14	3.5	4.7
		24	<u>2.9</u>	<u>3.6</u>
	MEAN		3.08	4.57
	STANDARD DEVIATION		0.29	0.64
9. <u>Big Gull</u>	Jul	13	3.7	2.7
10. <u>Big Rideau</u>	Jun	24	3.7	3.1

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
11. <u>Black</u>	May	28	4.3	3.8
	Jun	11	3.4	2.7
		24	4.9	1.9
	Jul	11	4.6	1.6
		25	5.2	1.7
	Aug	8	5.2	2.0
		22	5.2	1.6
	Sep	5	<u>4.9</u>	<u>1.5</u>
	MEAN		4.71	2.10
	STANDARD DEVIATION		0.62	0.79
12. <u>Black</u>	Aug	5	3.3	3.8
13. <u>Bob's Lake</u> <u>Buck Bay</u>	May	10	4.0	1.2
		19	4.4	2.9
	Jul	6	4.0	1.8
	Aug	15	3.7	3.8
	Sep	20	3.0	7.6
	Oct	12	<u>3.1</u>	<u>9.6</u>
	MEAN		3.70	4.48
	STANDARD DEVIATION		0.55	3.37
<u>Bob's Lake</u> <u>Crow Bay</u>	Jun	8	3.4	2.0
		15	3.7	---
		22	3.9	5.1
		29	4.3	2.2
	Jul	3	4.3	3.8
		7	4.1	2.7
		13	3.9	2.3
		20	3.4	1.9
	Aug	12	<u>4.0</u>	<u>2.9</u>
	MEAN		3.89	2.86
	STANDARD DEVIATION		0.34	1.09
<u>Bob's Lake</u> <u>Green Bay</u>	Jun	22	4.9	1.9
	Aug	25	5.6	4.6
<u>Bob's Lake</u> <u>Mill Bay</u>	Aug	10	2.9	13.2
		25	2.8	3.3
	Sep	7	2.6	---
		21	2.6	2.3
	Oct	5	2.7	2.4
		25	<u>2.6</u>	<u>---</u>
	MEAN		2.70	5.30
	STANDARD DEVIATION		0.13	5.29

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Bob's Lake</u> Mud Bay	Jul	10	4.3	3.5
		18	4.6	---
		25	4.0	2.5
	Aug	5	4.0	4.0
		11	4.4	9.6
		22	3.2	3.4
		27	4.0	5.7
	Sep	1	2.6	6.1
		11	3.0	3.3
		16	2.4	4.6
		22	2.1	6.0
		29	<u>3.0</u>	<u>5.5</u>
	MEAN		3.47	4.93
	STANDARD DEVIATION		0.85	1.98
<u>Bob's Lake</u> Western Basin #1	Aug	1 AM	3.7	1.8
		1 PM	3.7	2.1
		13	3.8	3.4
	Sep	6	4.0	3.3
		20	3.4	4.6
	Oct	12	<u>3.0</u>	<u>4.3</u>
	MEAN		3.60	3.25
	STANDARD DEVIATION		0.35	1.13
Western Basin #2	May	10	2.7	2.5
	Jun	15	3.0	3.8
		25	2.7	1.6
	Aug	3	3.4	1.5
		6	3.0	1.7
		17	2.7	2.3
		18	<u>2.7</u>	<u>2.2</u>
	MEAN		2.89	2.23
	STANDARD DEVIATION		0.27	0.79
14. <u>Boulter</u>	May	25	3.4	3.9
	Jun	1	3.4	4.0
		21	3.0	3.7
		30	3.0	4.5
	Aug	24	3.0	2.7
	Sep	21	<u>3.0</u>	<u>3.0</u>
	MEAN		3.13	3.63
	STANDARD DEVIATION		0.21	0.67

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
15. <u>Brule</u>	Jun 14	6.4	1.9
	16	6.9	2.2
	27	6.3	1.0
	30	7.4	1.6
	Jul 4	8.0	1.3
	25	6.2	1.6
	Aug 1	6.2	0.9
	4	7.3	1.4
	10	6.6	1.2
	12	6.8	1.9
	22	6.7	1.3
	Sep 2	<u>7.1</u>	<u>1.0</u>
	MEAN	6.83	1.44
	STANDARD DEVIATION	0.55	0.41
16. <u>Buck</u> North Bay South End	Jul 18	4.3	2.3
	27	4.4	3.3
	Aug 2	4.6	1.9
	9	4.1	3.1
	17	4.3	3.4
	24	4.6	3.4
	Sep 28	4.7	4.8
	Nov 16	<u>3.7</u>	<u>2.6</u>
	MEAN	4.34	3.10
	STANDARD DEVIATION	0.32	0.88
<u>Buck</u> North Bay North End	Apr 19	3.4	2.4
	27	3.1	1.8
	May 19	3.4	3.3
	25	4.0	3.8
	Jun 7	3.7	3.7
	15	3.9	4.2
	21	3.7	3.6
	Jul 2	3.7	4.1
	13	4.3	2.2
	20	3.8	2.6
	30	3.0	2.8
	Aug 1	3.5	3.6
	5	3.7	2.2
	7	3.7	2.2
	11	3.7	3.2
	13	4.0	2.7
	17	3.4	3.2
	25	3.8	2.7
	31	3.4	3.1
	Sep 1	3.4	4.2
	10	3.4	4.1
	29	3.8	3.9
	Oct 12	<u>4.0</u>	<u>3.0</u>
	MEAN	3.64	3.16
	STANDARD DEVIATION	0.31	0.73

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
17. <u>Buckshot</u>	Jul	6	4.6	1.1
	-----	---	1.3	
	Sep	1	5.0	0.9
18. <u>Burridge</u>	May	19	3.2	2.5
	Jun	8	3.2	4.5
		15	3.9	4.0
		23	3.5	1.4
		30	4.7	1.8
	Jul	7	3.9	2.4
		13	5.2	1.4
		21	4.3	1.9
		27	4.6	---
	Aug	4	5.3	2.5
		10	5.8	1.9
		16	3.0	2.9
		24	7.3	2.0
	Sep	1	4.3	1.9
		7	4.3	2.1
		20	4.3	2.2
		28	<u>4.9</u>	<u>2.7</u>
	MEAN		4.45	2.38
	STANDARD DEVIATION		1.07	0.85
19. <u>Carson</u>	May	12	5.2	2.2
		19	4.6	1.9
		27	4.6	3.5
	Jun	14	4.6	1.4
		28	4.6	1.3
	Jul	6	5.5	2.0
		10	5.8	1.4
		24	5.5	2.4
		30	5.3	2.0
	Aug	5	5.3	2.7
		13	5.5	2.3
		19	5.5	1.8
	Sep	2	5.8	1.9
		9	<u>5.8</u>	<u>1.3</u>
	MEAN		5.26	2.01
	STANDARD DEVIATION		0.47	0.61
20. <u>Cashel</u> #1	May	19	7.6	---
	Jun	1	6.0	0.5
		22	4.9	1.1
	Jul	6	5.8	3.1
		13	6.1	1.3
	Aug	4	<u>4.3</u>	<u>1.6</u>
	MEAN		5.78	1.52
	STANDARD DEVIATION		1.13	0.97

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL a (ug/l)
<u>Cashel</u> #2	May	19	7.3	0.7
	Jun	17	7.2	0.8
		22	4.8	1.3
	Jul	6	6.1	1.5
		13	5.8	1.4
	Aug	4	<u>4.0</u>	<u>1.7</u>
	MEAN		5.87	1.23
	STANDARD DEVIATION		1.30	0.40
21. <u>Cedar</u>	Jun	1	2.9	34.0
		16	2.1	4.2
		21	2.4	3.3
		28	2.6	1.4
	Jul	5	2.4	1.8
		18	2.6	1.9
		26	2.0	4.0
	Aug	2	<u>2.9 (Bottom)</u>	<u>3.4</u>
	MEAN		2.49	6.75
	STANDARD DEVIATION		0.33	11.06
22. <u>Charleston</u> <u>Big Water</u>	Jun	14	2.7	6.7
		30	3.0	2.5
	Jul	6	3.5	1.1
		13	3.7	0.9
		20	5.6	1.7
		27	4.0	3.7
	Aug	5	4.0	4.2
		10	5.8	2.0
		17	4.6	2.1
		24	5.2	2.7
		31	3.7	1.3
	Sep	16	4.0	1.8
		25	3.7	2.7
	Oct	2	<u>4.3</u>	<u>2.4</u>
	MEAN		4.13	2.56
	STANDARD DEVIATION		0.91	1.51
<u>Charleston</u> <u>Deep Water</u>	Jun	15	3.4	4.9
		30	3.2	2.8
	Jul	6	3.7	1.0
		20	5.2	1.8
		27	5.5	2.9
	Aug	5	4.3	3.4
		10	4.6	1.6
		17	4.6	2.6
		24	5.2	2.6
		31	4.7	1.1
	Sep	16	4.0	2.2
		25	4.3	2.5
	Oct	20	<u>3.4</u>	<u>2.3</u>
	MEAN		4.32	2.44
	STANDARD DEVIATION		0.75	1.02

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Charleston</u> Webster Bay	Jun	16	3.4	4.5
		23	3.9	5.7
		30	3.7	3.1
	Jul	14	4.7	1.2
		21	4.4	2.3
		28	4.1	2.8
	Aug	4	5.6	3.3
		18	4.1	2.3
	Sep	2	5.0	1.5
		8	4.3	---
		15	5.0	1.6
		22	4.1	1.7
		29	<u>4.3</u>	<u>1.1</u>
	MEAN		4.35	2.59
	STANDARD DEVIATION		0.60	1.40
<u>Charleston</u> Western Water	Jun	16	3.5	6.0
		23	3.7	4.4
		30	3.4	3.1
	Jul	14	4.4	1.2
		21	4.1	2.5
		28	4.1	3.1
	Aug	4	5.6	3.6
		18	4.1	2.5
	Sep	8	4.3	2.2
		15	5.2	1.8
		22	4.4	1.7
		29	<u>5.0</u>	<u>1.1</u>
	MEAN		4.32	2.77
	STANDARD DEVIATION		0.67	1.41
<u>Charleston</u> Goose Island	Jun	16	3.2	4.7
		23	3.7	3.2
		30	3.7	2.7
	Jul	14	4.7	1.1
		21	4.2	1.9
		28	3.8	2.9
	Aug	4	5.3	3.7
		18	3.5	2.2
	Sep	2	4.4	1.4
		8	4.0	1.5
		15	5.0	1.2
		22	4.4	1.8
		29	<u>4.9</u>	<u>1.1</u>
	MEAN		4.22	2.26
	STANDARD DEVIATION		0.64	1.12

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
23. <u>Chippego</u>	May	4	2.4	4.6
		16	2.7	6.9
		19	2.7	4.9
	Jun	10	2.4	8.5
		15	2.6	7.0
		22	2.6	---
		29	2.9	7.0
	Jul	6	3.0	3.6
		14	3.0	3.2
		20	3.4	6.9
		28	3.0	9.0
	Aug	4	3.7	8.0
		13	3.8	5.4
		17	3.8	4.8
		22	3.2	2.7
	Sep	1	3.7	7.2
		14	3.4	2.5
		-North	21	2.2
		-South	21	6.6
		-North	29	2.5
		-South	29	3.1
	Oct	13	<u>3.4</u>	<u>2.8</u>
	MEAN		3.14	5.21
	STANDARD DEVIATION		0.47	2.22
24. <u>Christie</u>	Jun	22	4.1	1.2
	Jul	6	4.9	1.7
	Aug	4	6.0	2.8
		11	6.0	2.0
		17	6.0	1.6
	Sep	7	3.8	4.6
		21	3.4	5.3
	Oct	13	<u>3.4</u>	<u>7.0</u>
	MEAN		4.70	3.28
	STANDARD DEVIATION		1.17	2.11
25. <u>Clayton</u>	Jun	24	3.8	1.2
	Jul	1	3.8	2.9
		9	3.5	1.7
		13	3.8	2.8
		27	3.0	3.0
	Aug	4	3.8	2.0
		10	4.0	3.2
		17	3.5	2.7
		24	4.0	2.9
	Sep	1	3.5	---
		7	<u>3.0</u>	<u>6.5</u>
	MEAN		3.61	2.89
	STANDARD DEVIATION		0.35	1.42

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
26. <u>Clear</u> #1	Jul 1	3.9	1.9
	7	5.6	1.5
	14	5.3	1.4
	20	5.0	1.3
	27	4.3	3.6
	Aug 4	4.1	1.9
	17	3.2	2.4
	24	2.9	2.0
	Sep 1	2.6	2.4
	7	4.4	2.3
	21	<u>3.8</u>	<u>2.4</u>
	MEAN	4.10	2.10
	STANDARD DEVIATION	0.96	0.64
<u>Clear</u> #2	Jul 1	4.4	1.4
	6	3.9	1.7
	13	5.2	2.1
	27	5.3	4.9
	Aug 4	4.1	2.4
	10	4.1	2.4
	17	3.4	2.0
	24	2.6	2.2
	Sep 1	2.9	2.3
	7	<u>4.3</u>	<u>3.0</u>
	MEAN	4.02	2.44
	STANDARD DEVIATION	0.88	0.97
<u>Clear</u> #3	Jun 22	4.9	4.5
	26	5.2	3.3
	29	<u>5.2</u>	<u>2.5</u>
	MEAN	5.10	3.43
	STANDARD DEVIATION	0.17	1.01
27. <u>Collins Bay</u>	May 25	3.7	4.2
	Jul 5	2.1	5.1
	27	1.7	4.6
	Sep 1	1.8	9.5
	18	2.7	3.8
	28	<u>5.0</u>	<u>4.9</u>
	MEAN	2.83	5.35
	STANDARD DEVIATION	1.29	2.09

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
28. <u>Colton</u>	May 16	6.1	---
	25	6.0	1.7
	29	6.9	2.1
	Jun 5	7.1	1.2
	17	6.0	2.1
	26	5.5	1.9
	Jul 3	6.3	1.7
	13	6.0	1.3
	17	5.3	1.1
	24	6.9	1.0
	Aug 8	7.3	0.9
	22	6.6	0.5
	Sep 6	6.2	1.2
	12	5.8	1.3
	23	5.8	1.8
	Oct 2	<u>6.1</u>	<u>1.3</u>
	MEAN	6.24	1.41
	STANDARD DEVIATION	0.57	0.46
29. <u>Constan</u>	Jun 7	5.2	0.9
	13	5.8	1.0
	16	4.6	2.1
	27	3.0	1.7
	Jul 2	3.7	3.0
	7	4.0	2.7
	16	3.4	2.6
	22	4.0	3.4
	Aug 1	4.3	1.0
	9	3.4	2.3
	26	3.4	2.5
	Sep 3	<u>3.4</u>	<u>2.2</u>
	MEAN	4.02	2.12
	STANDARD DEVIATION	0.83	0.82
30. <u>Cranberry</u>	Jun 5	3.2	3.0
	11	3.4	4.4
	18	2.4	6.1
	24	3.2	5.9
	Jul 3	2.3	8.2
	17	2.0	10.0
	23	2.4	10.7
	Aug 5	1.6	3.2
	11	1.4	20.1
	19	1.4	19.1
	Sep 3	1.1	1.6
	10	<u>1.4</u>	<u>21</u>
	MEAN	2.15	9.44
	STANDARD DEVIATION	0.80	6.97

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
31. <u>Crosby</u>	May	11	3.7	0.6
	Jun	2	4.3	1.5
		15	3.7	5.0
		22	3.2	1.5
	Jul	13	4.9	1.1
		20	3.7	1.1
		27	4.9	1.5
	Aug	3	4.3	4.3
		10	3.8	3.0
		17	4.6	3.1
		24	4.0	3.5
		31	<u>3.4</u>	<u>5.2</u>
	MEAN		4.04	2.62
	STANDARD DEVIATION		0.56	1.62
32. <u>Cross</u>	Jul	2	3.7	2.2
		9	5.0	1.6
		17	5.2	1.8
		25	3.8	2.8
		31	4.7	1.9
	Aug	6	5.2	2.1
		14	4.9	1.0
		19	<u>4.7</u>	<u>1.5</u>
	MEAN		4.65	1.86
	STANDARD DEVIATION		0.59	0.53
33. <u>Crow</u>	Jun	7	4.1	3.5
34. <u>Crowe</u>	Jun	15	2.6	6.1
		22	2.6	3.6
	Jul	6	1.9	3.1
		13	2.3	2.0
		19	2.7	2.4
		27	3.5	3.2
	Aug	4	3.5	2.3
		10	3.7	2.9
		17	2.9	2.6
		24	3.8	2.4
	Sep	7	3.7	2.5
		14	2.9	3.3
		22	<u>2.7</u>	<u>5.9</u>
	MEAN		2.98	3.25
	STANDARD DEVIATION		0.60	1.30

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL a (ug/l)	
35. <u>Dalhousie</u> #1	Jun	16	5.8	1.3	
		23	5.8	1.2	
		30	4.9	1.6	
	Jul	15	4.9	2.7	
		24	5.0	3.0	
	Aug	4	4.3	2.3	
		10	4.6	2.3	
		19	5.2	1.6	
		24	5.2	1.7	
	MEAN		5.08	1.97	
	STANDARD DEVIATION		0.50	0.63	
	<u>Dalhousie</u> #2	Jun	30	4.3	1.6
		Jul	7	3.7	17.0
			13	5.5	1.5
			20	2.7	1.4
		Aug	4	5.5	2.5
			10	5.8	1.9
			17	3.2	1.2
		Sep	7	3.7	1.8
			21	4.3	3.6
		MEAN 4.30		3.61	
		STANDARD DEVIATION		1.10	5.07
<u>Dalhousie</u> #3	Jun	22	4.1	1.8	
	Jul	1	3.4	1.8	
		13	3.8	1.6	
		31	3.0	5.9	
	Aug	17	3.5	2.8	
	Sep	7	3.5	2.7	
	MEAN		3.55	2.77	
	STANDARD DEVIATION		0.37	1.62	
	<u>Dalhousie</u> #66	Jul	3	5.0	2.0
	36. <u>Dempseys</u> (Virgin)	Jul	9	4.1	1.2
		16	3.2	3.0	
		23	4.0	2.8	
		31	4.7	2.8	
Aug		7	5.2	2.4	
Sep		20	3.7	1.9	
MEAN		4.15	2.35		
STANDARD DEVIATION		0.71	0.69		
37. <u>Desert</u> #1		Jun	27	4.6	2.3
		Jul	5	4.6	2.2
			27	4.0	1.3
	Aug	7	3.5	2.0	
		17	4.1	1.8	
		24	5.3	2.4	
	MEAN		4.35	2.00	
STANDARD DEVIATION		0.62	0.40		

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Desert</u> #2	Jun	27	4.6	2.3
	Jul	5	3.9	1.9
		27	4.5	1.0
	Aug	7	3.2	2.0
		17	4.1	1.8
		24	5.1	2.6
	Sep	7	<u>5.9</u>	<u>4.0</u>
	MEAN		4.47	2.23
	STANDARD DEVIATION		0.87	0.93
<u>Desert</u> #3	May	19	3.8	---
		25	4.6	2.3
	Jun	1	4.9	2.5
		8	4.7	2.2
		16	5.3	3.0
		22	5.5	3.3
		30	4.9	2.0
	Jul	13	5.2	2.9
		21	5.2	4.2
	Aug	4	4.6	1.8
		13	5.2	1.2
		17	5.2	3.0
		24	5.2	1.4
	Sep	1	5.3	2.5
		7	<u>5.5</u>	<u>3.4</u>
	MEAN		5.01	2.55
	STANDARD DEVIATION		0.44	0.82
38. <u>Devil</u> A	Sep	7	4.6	1.5
B	Sep	7	4.6	2.1
39. <u>Diamond</u>	Jul	13	4.6	--
		20	4.9	1.8
		27	4.3	1.7
	Aug	10	3.4	1.3
		13	4.0	1.3
		17	4.9	1.2
		24	4.6	0.9
	Sep	1	4.3	1.2
		13	<u>4.0</u>	<u>1.1</u>
	MEAN		4.33	1.31
	STANDARD DEVIATION		0.48	0.30

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
40. <u>Dickey</u> North	Jul	27	4.4	1.4
	Aug	5	4.7	1.4
		8	3.8	1.6
		17	4.7	0.8
		22	4.4	1.5
	Sep	1	5.3	1.2
	Oct	1	4.9	1.1
		13	4.3	1.0
	Nov	6	<u>5.1</u>	<u>1.0</u>
	MEAN		4.62	1.22
	STANDARD DEVIATION		0.45	0.27
	<u>Dickey</u> South	Jul 27	5.0	1.2
		Aug 5	5.2	---
		8	4.7	1.6
		17	5.3	1.1
		22	4.9	1.6
	Sep	1	6.1	1.3
	Oct	1	5.2	1.5
		13	3.2	0.8
	Nov	6	<u>5.9</u>	<u>0.9</u>
	MEAN		5.06	1.25
	STANDARD DEVIATION		0.83	0.31
41. <u>Dog</u> (Little Dog)	Jun	22	1.7	14
	Jul	5	2.0	5.8
	Aug	5	1.1	29.2
		11	0.8	40
		24	1.0	28
	Sep	1	1.1	34
		11	0.5	30
		22	<u>1.1</u>	<u>1.1</u>
	MEAN		1.16	22.8
	STANDARD DEVIATION		0.48	14.0
42. <u>Dore</u>	Jun	24	4.6	1.2
	Jul	13	4.6	2.5
		27	4.6	1.7
	Aug	3	5.0	2.2
		10	4.7	3.9
		17	4.0	4.2
		23	<u>3.5</u>	<u>5.1</u>
	MEAN		4.43	2.97
	STANDARD DEVIATION		0.51	1.44

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
43. <u>Duncan</u>	Jul 1	2.6	2.5
	8	2.9	3.1
	28	2.4	3.7
	Aug 5	2.4	2.8
	12	3.4	2.1
	20	2.6	2.6
	25	2.4	2.0
	Sep 3	<u>2.4</u>	<u>1.6</u>
	MEAN	2.64	2.55
	STANDARD DEVIATION	0.35	0.67
44. <u>Dutch</u>	Jun 1	2.3	3.2
	12	2.6	3.3
45. <u>Eagle</u> #1	Jun 7	4.3	2.5
	16	3.8	2.9
	Jul 27	5.2	2.5
	Aug 17	4.0	1.3
	24	6.2	1.2
	Sep 1	<u>5.0</u>	<u>3.9</u>
	MEAN	4.75	2.38
	STANDARD DEVIATION	0.90	1.02
<u>Eagle</u> #2	May 11	---	4.2
	19	4.1	3.3
	25	4.4	3.1
	Jun 1	4.1	4.6
	8	4.1	2.9
	15	---	2.9
	22	4.4	3.0
	Jul 1	4.1	2.6
	6	4.4	2.8
	13	4.7	1.9
	20	4.7	1.8
	27	5.3	2.4
	Aug 3	5.3	2.4
	10	5.6	3.5
	17	5.9	3.7
	24	5.9	3.1
	Sep 1	5.0	3.2
	7	5.6	4.6
	14	---	2.7
	21	4.4	2.4
	28	<u>4.3</u>	<u>3.5</u>
	MEAN	4.79	3.08
	STANDARD DEVIATION	0.65	0.76

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
46. <u>Farren</u>	Jul	27	6.0	---
		28	5.0	2.5
	Aug	4	5.6	3.3
		10	6.0	2.8
		17	5.0	1.8
		24	5.3	2.1
	Sep	1	3.8	1.9
		7	3.8	1.7
		21	3.5	1.5
		28	4.7	1.9
	Oct	13	<u>3.2</u>	<u>1.4</u>
	MEAN		4.72	2.09
	STANDARD DEVIATION		1.00	0.60
47. <u>Gananoque</u>	Jun	1	2.0	3.7
		15	1.8	4.2
		22	1.8	3.9
		30	1.7	5.0
	Jul	6	1.8	8.9
		13	3.0	6.5
		20	1.5	12.1
	Aug	1	1.7	2.9
		5	1.5	2.0
		10	1.7	6.4
		17	1.7	5.2
		31	1.2	4.9
	Sep	13	<u>2.4</u>	<u>3.7</u>
	MEAN		1.83	5.34
	STANDARD DEVIATION		0.45	2.69
48. <u>Glanmire</u>	Aug	4	3.0	5.9
		10	3.4	17.5
		17	3.4	2.8
	Sep	21	<u>2.1</u>	<u>6.9</u>
	MEAN		2.98	8.28
	STANDARD DEVIATION		0.61	6.39
49. <u>Golden</u>	Jun	30	4.6	0.4
	Jul	21	3.7	2.5
	Aug	12	4.0	3.0
		22	2.7	2.4
		24	3.4	2.8
	Sep	1	3.0	2.5
		1	3.4	4.1
		14	<u>4.6</u>	<u>2.8</u>
	MEAN		3.68	2.56
	STANDARD DEVIATION		0.69	1.03

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
50. <u>Green</u>	May	4	5.3	0.7
		19	7.8	1.1
	Jun	1	6.7	0.4
		15	9.3	1.2
		22	10.4	2.8
	Jul	1	8.7	1.4
		13	8.7	0.7
		20	9.9	0.9
		27	8.9	0.8
	Aug	5	10.2	1.0
		24	11.9	1.0
	Sep	7	9.2	1.3
		13	<u>8.5</u>	<u>1.0</u>
	MEAN		8.88	1.10
	STANDARD DEVIATION		1.67	0.58
51. <u>Grindstone</u>	Sep	21	3.5	1.4
52. <u>Grippen</u>	Jul	4	2.9	2.8
		8	2.9	3.0
		20	3.2	5.2
	Aug	3	4.4	7.0
		6	4.1	3.9
		11	3.8	5.5
		17	4.7	5.0
		21	4.4	5.3
	Sep	1	4.1	2.6
		7	4.1	3.3
		25	3.7	2.0
	Nov	2	<u>3.5</u>	<u>2.7</u>
	MEAN		3.82	4.03
	STANDARD DEVIATION		0.59	1.54
53. <u>Gunter</u> <u>22A</u>	May	19	4.6	---
	Jun	2	4.6	1.1
	Jul	3	3.8	1.4
		25	3.0	1.9
	Aug	6	2.7	2.3
		20	4.0	1.9
	Sep	1	4.3	1.2
	Oct	8	2.7	1.3
	<u>Gunter</u> <u>22B</u>	May	19	---
		Jun	2	3.0
		Jul	3	1.5
		25	2.7	1.9
		Aug	6	2.8
		20	3.4	2.0
		Sep	1	3.2
		25	3.0	2.2
	Oct	8	<u>2.7</u>	<u>1.6</u>
	MEAN		3.61	1.95
	STANDARD DEVIATION		0.74	0.65

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
54. <u>Hambly</u> (Silver)	May	19	3.7	0.7
	Jun	29	3.4	2.8
	Aug	11	4.3	12.1*
		19	4.1	11.8
	Sep	9	4.9	9.5
		25	4.6	6.4
	Oct	15	<u>3.2</u>	<u>4.9</u>
	MEAN		4.03	6.89
	STANDARD DEVIATION		0.63	4.42
55. <u>Hay Bay</u>	Apr	9	0.5	2.0
		24	1.1	16
	May	2	1.2	14
	Jul	27	1.0	21.4
		29	1.0	28.8
	Aug	8	0.8	22
		29	1.0	29
	Sep	8	0.8	30
		25	0.9	26
		29	1.1	28
	Oct	3	0.8	20
		10	0.9	16
		22	0.9	10
	Nov	13	<u>1.4</u>	<u>16</u>
	MEAN		0.96	19.94
	STANDARD DEVIATION		0.21	8.19
56. <u>Horseshoe</u>	Jun	8	2.4	1.7
		15	2.4	4.1
		22	<u>2.4</u>	<u>3.8</u>
	MEAN		2.40	3.20
	STANDARD DEVIATION		0.00	1.31
57. <u>Indian</u>	Jul	14	3.7	2.4
		28	3.5	3.0
	Aug	5	3.8	4.1
		11	3.3	3.7
		19	3.0	2.4
	Sep	8	4.0	2.4
		18	4.3	2.8
		29	3.7	2.1
	Oct	5	4.9	3.8
		13	4.9	2.7
		17	<u>4.0</u>	<u>3.0</u>
	MEAN		3.92	2.95
	STANDARD DEVIATION		0.60	0.66

* Average of 5 mid-lake samples for August 11.

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
58. <u>Joe Perry</u>	Jun 11	2.4	2.6
	Jul 10	3.7	2.1
	Aug 7	2.4	1.5
	21	<u>3.7</u>	<u>2.0</u>
	MEAN	3.05	2.05
	STANDARD DEVIATION	0.75	0.45
59. <u>Kamaniskeg</u> (east of Mask Island)	May 27	3.7	5.2
	Jun 6	4.6	2.4
	23	4.6	1.8
	Jul 7	4.6	2.6
	21	4.9	2.6
	31	4.9	1.9
	Aug 11	5.5	2.8
	25	5.2	2.7
	Sep 5	4.6	1.5
	19	4.9	2.8
	Oct 6	<u>4.6</u>	<u>1.1</u>
	MEAN	4.74	2.49
	STANDARD DEVIATION	0.45	1.07
<u>Kamaniskeg</u> (west of Mask Island)	May 27	3.7	4.1
	Jun 6	4.6	1.9
	23	5.2	1.6
	Jul 7	4.6	3.4
	21	4.6	2.3
	31	5.2	2.3
	Aug 11	5.5	3.3
	25	5.2	2.8
	Sep 5	4.6	1.5
	19	4.9	3.0
	Oct 6	<u>4.6</u>	<u>1.2</u>
	MEAN	4.79	2.49
	STANDARD DEVIATION	0.49	0.91
<u>Kamaniskeg</u> A) S. of Mask Isl.	Aug 4	4.9	2.5
	10	5.1	3.1
	Sep 1	4.4	2.7
B) S. End of Lake	Aug 4	4.4	2.5
	10	5.0	3.4
	Sep 1	<u>4.7</u>	<u>1.7</u>
	MEAN	4.75	2.65
	STANDARD DEVIATION	0.30	0.59

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
60. <u>Kashwakamak</u>	Jul 1	3.2	2.0
	6	2.6	2.3
	13	2.4	1.6
	27	2.4	1.5
	Aug 8	2.7	1.7
	10	3.5	2.8
	18	2.4	2.3
	Sep 6	2.6	3.7
	20	2.3	1.3
	28	1.4	2.0
	Oct 13	2.5	1.8
	Nov 2	<u>2.7</u>	<u>2.3</u>
	MEAN	2.56	2.11
	STANDARD DEVIATION	0.51	0.65
61. <u>Kennebec</u> <u>A</u>	May 4	1.7	14.0
	19	1.6	11.8
	Jun 1	1.7	14.0
	22	1.8	8.3
	Jul 6	2.4	3.4
	27	2.5	3.5
	Aug 12	3.0	3.7
	Sep 7	3.9	2.5
	21	3.3	2.8
	Oct 12	3.4	3.4
	Nov 2	<u>3.1</u>	<u>2.7</u>
	MEAN	2.58	6.37
	STANDARD DEVIATION	0.81	4.73
<u>Kennebec</u> <u>B</u>	May 4	1.8	9.0
	19	2.2	7.8
	Jun 1	2.1	9.3
	22	1.9	4.4
	Jul 6	2.4	2.8
	27	3.4	3.1
	Aug 12	3.0	2.8
	Sep 7	3.7	2.3
	21	3.2	3.5
	Oct 12	2.7	3.4
	Nov 2	<u>2.8</u>	<u>2.3</u>
	MEAN	2.65	4.61
	STANDARD DEVIATION	0.63	2.71
<u>Kennebec</u> <u>C</u>	Jun 1	1.7	9.2
	7	1.9	4.6
	8	1.8	8.0
	15	1.7	9.4
	22	1.9	5.7
	29	1.5	3.6
	Sep 7	3.0	2.4
	14	<u>2.4</u>	<u>2.6</u>
	MEAN	1.99	5.69
	STANDARD DEVIATION	0.49	2.86

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
62. <u>Limerick</u>	May 19	3.0	2.4
	Jun 30	5.2	1.1
	Jul 18	4.9	1.2
	31	4.9	---
	Aug 5	4.3	1.0
	14	4.9	1.6
	20	4.9	1.4
	Sep 3	4.6	1.9
	8	<u>5.5</u>	<u>1.5</u>
	MEAN	4.69	1.51
	STANDARD DEVIATION	0.72	0.46
63. <u>Loughborough</u> <u>East Basin</u>	Jun 2	3.8	1.8
	9	3.7	3.8
	16	3.8	6.9
	23	3.2	7.4
	Jul 2	3.7	4.0
	9	3.0	4.3
	17	3.2	4.1
	30	2.7	8.1
	Aug 12	2.4	7.0
	20	2.3	6.7
	27	2.9	5.0
	Sep 4	2.9	4.6
	11	3.0	4.7
	18	3.7	3.2
	24	3.4	4.9
	Oct 18	<u>3.7</u>	<u>5.3</u>
	MEAN	3.21	5.11
	STANDARD DEVIATION	0.50	1.70
<u>Loughborough</u> <u>West Basin</u>	May 23	5.5	1.7
	Jun 5	5.3	3.5
	22	3.4	5.0
	Jul 4	4.1	2.5
	14	4.1	2.7
	21	4.0	1.9
	30	4.1	---
	Aug 7	4.7	1.3
	17	5.5	2.2
	24	6.2	2.4
	Sep 4	<u>6.1</u>	<u>1.7</u>
	MEAN	4.82	2.49
	STANDARD DEVIATION	0.95	1.08
64. <u>Mackie</u>	Apr 21	4.3	2.1
	27	3.7	2.0
	May 19	3.7	2.4
	Jun 16	6.1	6.7
	Jul 10	4.9	7.0
	Aug 11	5.2	10.6
	Sep 8	<u>6.2</u>	<u>2.8</u>
	MEAN	4.87	4.80
	STANDARD DEVIATION	1.04	3.34

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
65. <u>Mazinaw</u> Upper Basin	May 4	4.6	0.8
	Jun 11	3.0	2.5
	Jul 10	3.0	1.5
	24	6.1	1.8
	Aug 7	5.5	1.7
	21	<u>5.2</u>	<u>2.0</u>
	MEAN	4.57	1.72
	STANDARD DEVIATION	1.31	0.56
	<u>Mazinaw</u> Lower Mazinaw	May 19	3.9
		25	4.4
	Jun 15	4.4	1.7
	22	4.6	1.3
	Jul 1	4.4	2.5
	15	4.4	1.0
	17	5.2	1.2
	20	5.2	1.2
	Aug 5	5.0	1.1
	10	5.3	1.4
	18	4.9	1.4
	25	6.4	1.0
	Sep 2	5.2	0.9
	7	5.5	0.8
	21	5.5	1.0
	28	<u>5.5</u>	<u>0.8</u>
	MEAN	4.99	1.22
	STANDARD DEVIATION	0.62	0.43
66. <u>Miller</u>	Jun 1	2.9	19
	15	2.0	28
	22	2.1	16
	30	2.3	24
	Jul 5	2.1	12
	13	2.0	7.5
	27	2.3	20.6
	Aug 4	2.4	54.6
	10	<u>2.4</u>	<u>40</u>
	MEAN	2.28	24.63
	STANDARD DEVIATION	0.28	14.67
67. <u>Mink</u>	Jul 14	4.6	2.4
	Aug 5	3.8	8.5
	11	3.9	2.9
	18	4.0	1.8
	25	4.4	2.4
	Sep 24	<u>3.8</u>	<u>2.8</u>
	MEAN	4.08	3.47
	STANDARD DEVIATION	0.34	2.50

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
68. <u>Mississippi</u> First Lake	Jul 23	3.8	4.3
	23	2.3	2.8
	29	1.8	2.3
	Aug 28	<u>3.0</u>	<u>2.5</u>
	MEAN	2.73	2.98
	STANDARD DEVIATION	0.87	0.91
69. <u>Mosque</u> #1	May 25	6.1	2.1
	Jul 4	5.8	1.6
	Aug 5	6.4	1.0
	17	6.2	1.7
	Sep 1	5.6	1.9
	Oct 12	<u>4.9</u>	<u>1.7</u>
	MEAN	5.83	1.67
	STANDARD DEVIATION	0.54	0.37
<u>Mosque</u> #2	May 25	6.1	1.8
	Jul 4	6.1	1.4
	Aug 5	6.1	0.8
	17	5.2	1.6
	Sep 1	5.8	1.6
	Oct 12	<u>5.2</u>	<u>1.9</u>
	MEAN	5.75	1.52
	STANDARD DEVIATION	0.44	0.39
<u>Mosque</u> #3	Jul 4	4.6	1.6
	Aug 5	5.2	2.4
	17	6.4	3.7
	Sep 8	5.5	1.9
	Oct 12	<u>4.0</u>	<u>3.4</u>
	MEAN	5.14	2.60
	STANDARD DEVIATION	0.91	0.92
70. <u>Olmsted</u>	Jun 15	5.8	2.0
	Jul 6	5.2	2.4
	20	5.5	2.1
	Aug 3	5.5	2.9
	17	5.5	2.5
	31	5.8	3.1
	Sep 14	4.9	---
	28	5.2	2.9
	Oct 15	<u>5.2</u>	<u>2.7</u>
	MEAN	5.40	2.58
	STANDARD DEVIATION	0.30	0.40

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
71. <u>Opinicon</u> #1	Jun 2	4.0	1.4
	9	3.4	3.5
	22	3.7	2.6
	29	3.7	1.6
	Jul 6	4.0	---
	13	3.4	1.9
	24	4.3	3.4
	30	3.7	4.8
	Aug 5	3.7	2.9
	8	3.7	3.3
	19	3.0	4.6
	28	3.0	3.6
	Sep 2	2.1	3.9
	10	2.1	4.8
	16	2.7	5.1
	22	2.9	3.8
	29	3.2	7.0
	Oct 13	<u>2.7</u>	<u>2.3</u>
	MEAN	3.29	3.56
	STANDARD DEVIATION	0.63	1.43
<u>Opinicon</u> #2	Jun 22	3.0	4.2
	29	3.5	2.5
	Jul 6	3.4	2.9
	Aug 4	2.7	1.9
	11	3.4	4.6
	17	3.0	6.6
	24	3.4	6.2
	Sep 1	<u>2.7</u>	<u>7.5</u>
	MEAN	3.14	4.55
	STANDARD DEVIATION	6.33	2.06
72. <u>Otter</u> #1	Jun 25	3.7	1.9
	Jul 3	3.4	2.2
	9	3.0	1.9
	24	2.1	2.8
	31	2.3	3.2
	Aug 5	2.4	3.1
	12	2.4	2.7
	21	2.4	2.4
	Sep 4	2.4	2.2
	7	<u>2.4</u>	<u>2.0</u>
	MEAN	2.65	2.44
	STANDARD DEVIATION	0.53	0.48

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Otter</u> #2	May	25	2.7	2.8
	Jun	7	2.7	1.5
		14	2.4	2.3
		22	4.3	1.8
	Jul	12	2.7	3.6
		27	2.4	2.2
	Aug	4	2.7	1.7
		10	2.7	2.3
		17	2.7	2.4
	Sep	1	<u>2.4</u>	<u>1.6</u>
	MEAN		2.77	2.22
	STANDARD DEVIATION		0.56	0.64
73. <u>Otty</u> A	Jun	22	4.3	3.3
		29	4.9	2.5
	Jul	6	4.3	2.7
		13	4.3	2.3
		20	4.3	2.5
		27	4.9	3.1
	Aug	4	4.0	3.3
		10	4.0	3.1
		17	4.6	1.6
		24	4.6	2.7
	Sep	2	4.6	2.3
		7	<u>5.5</u>	<u>3.0</u>
	MEAN		4.53	2.71
	STANDARD DEVIATION		0.43	0.50
<u>Otty</u> B	Jun	22	4.6	4.2
		29	4.6	2.8
	Jul	6	4.6	2.0
		13	5.2	2.2
		20	4.3	2.3
		27	4.3	2.6
	Aug	4	4.0	3.3
		10	3.5	2.7
		17	4.3	1.9
		24	4.0	2.6
	Sep	2	4.6	---
		7	<u>4.6</u>	<u>2.1</u>
	MEAN		4.38	2.61
	STANDARD DEVIATION		0.43	0.67
<u>Otty</u> #79	Aug	7	4.2	2.9

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
74. <u>Palmerston</u>	Jun 1	6.1	1.3
	8	7.3	0.7
	15	9.1	1.8
	29	10.4	2.1
	Jul 7	9.7	1.7
	16	9.7	1.6
	21	8.2	1.2
	Aug 5	7.9	1.3
	17	9.2	1.4
	24	9.2	1.6
	Sep 1	7.6	1.3
	21	7.3	1.2
	28	<u>7.9</u>	<u>2.5</u>
	MEAN	8.43	1.52
	STANDARD DEVIATION	1.23	0.45
75. <u>Patterson</u>	Jul 21	3.75	1.3
76. <u>Paugh</u>	May 4	4.7	0.6
	20	6.0	1.2
	Jun 1	5.2	1.5
	22	---	1.4
	Aug 3	5.2	1.8
	10	5.0	1.6
	Sep 29	4.9	2.1
	Oct 17	<u>5.2</u>	<u>1.6</u>
	MEAN	5.17	1.48
	STANDARD DEVIATION	0.41	0.44
77. <u>Pike</u> #1	Jun 7	4.6	1.6
	21	3.7	1.8
	Jul 7	4.9	1.1
	13	4.0	3.1
	19	4.0	2.1
	21	3.7	3.3
	31	4.0	17.7
	Aug 4	3.4	4.0
	8	4.0	2.6
	20	3.7	2.7
	Sep 14	3.2	5.2
	28	<u>3.5</u>	<u>7.8</u>
	MEAN	3.89	4.42
	STANDARD DEVIATION	0.48	4.56
<u>Pike</u> #2	Jul 13	4.1	4.4
	Aug 3	3.8	2.1
	17	4.0	4.4
	Sep 2	3.4	6.4
	23	3.4	2.2
	Oct 13	3.2	6.5
	Nov 2	<u>4.0</u>	<u>3.7</u>
	MEAN	3.70	4.24
	STANDARD DEVIATION	0.36	1.77

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
	<u>Pike</u>	Aug 6	3.7	2.7
	<u>#74</u>			
78.	<u>Potspon</u>	May 8	2.1	3.3
		25	2.1	2.8
	Jun 1	2.7	3.4	
		12	3.4	2.7
		24	3.5	2.4
	Jul 3	3.5	3.4	
	Aug 7	3.7	4.0	
		12	2.6	4.0
		24	3.2	3.4
	Sep 28	2.4	3.5	
	Oct 17	2.6	1.9	
		27	<u>1.8</u>	<u>2.6</u>
	MEAN		2.80	3.12
	STANDARD DEVIATION		0.64	0.64
79.	<u>Red Horse</u>	May 4	2.6	3.6
	Jun 1	3.7	4.6	
		13	3.2	4.5
		22	4.0	5.0
	Jul 2	4.3	3.3	
		8	7.3	4.3
		15	3.4	3.4
		24	4.0	3.5
		29	3.2	6.7
	Aug 4	2.6	10.9	
		17	2.1	14.0
		26	2.1	8.1
	Sep 2	2.3	10.6	
		14	2.9	5.5
		28	3.8	3.6
	Oct 13	<u>3.2</u>	<u>6.0</u>	
	MEAN		3.42	6.10
	STANDARD DEVIATION		1.24	3.20
80.	<u>Robertson</u>	Jul 2	5.8	2.2
		10	5.0	3.6
		11	4.6	2.7
		17	4.3	4.0
		25	4.6	2.8
	Aug 11	5.2	4.5	
		17	4.9	2.1
		28	6.2	3.6
	Sep 8	6.2	1.8	
		15	7.8	1.3
		22	6.9	1.5
		29	7.2	1.7
	Oct 9	6.4	0.7	
		15	<u>7.0</u>	<u>1.3</u>
	MEAN		5.86	2.41
	STANDARD DEVIATION		1.12	1.15

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
81. <u>St. Andrews</u> <u>North Lake</u>	Jun	15	16
		25	6.3
	Jul	6	---
		13	8.7
		19	5.3
		26	7.3
	Aug	2	5.9
		4	8.4
		10	7.8
		16	8.2
		24	8.6
	Sep	1	10.4
		4	14.0
		19	12
		25	14
		27	12
	Oct	13	15
		19	11
		24	14
		31	13
		31	<u>12</u>
	MEAN		10.50
	STANDARD DEVIATION		3.25
82. <u>St. George</u>	Jun	1	2.1
		8	1.8
		15	2.7
		21	<u>1.2</u>
	MEAN		1.95
	STANDARD DEVIATION		0.62
83. <u>St. Peter</u>	Jun	25	2.8
	Jul	2	1.9
		9	2.8
		15	1.7
		30	1.6
	Aug	6	2.0
		13	2.8
		20	2.6
		27	3.1
	Sep	3	2.0
		10	1.3
		24	1.7
		30	<u>1.7</u>
	MEAN		2.15
	STANDARD DEVIATION		0.59

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
84. <u>Salmon Trout</u>	Jun 1	2.4	11
	22	2.4	6.2
	Jul 13	4.0	21
	26	4.7	17.4
	Aug 10	4.3	---
	Sep 1	3.5	13.0
	7	2.9	7.4
	Oct 18	<u>2.4</u>	<u>5.7</u>
	MEAN	3.33	11.67
	STANDARD DEVIATION	0.43	5.86
85. <u>Sand</u> Main Lake	Jun 26	2.9	1.6
	Jul 3	4.4	2.4
	10	3.2	2.5
	17	2.9	3.2
	24	2.9	3.4
	31	2.6	7.7
	Aug 7	3.0	3.0
	14	3.0	3.1
	21	3.0	3.5
	28	3.8	2.6
	Sep 4	3.0	5.1
	18	2.4	20
	30	<u>3.0</u>	<u>4.4</u>
	MEAN	3.08	4.81
	STANDARD DEVIATION	0.51	4.81
<u>Sand</u> West Bay	Jun 26	3.5	1.7
	Jul 3	3.0	2.1
	10	3.2	2.5
	17	3.2	2.8
	24	2.4	2.4
	31	2.3	2.9
	Aug 10	3.2	2.6
	14	2.7	3.3
	21	3.0	3.2
	28	3.0	2.2
	Sep 4	2.7	4.2
	18	2.6	2.9
	30	<u>2.7</u>	<u>3.1</u>
	MEAN	2.88	2.76
	STANDARD DEVIATION	0.35	0.63

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
86. <u>Sharbot</u> Cranberry Bay	Jun 12	3.2	3.6
	18	3.0	3.9
	26	---	4.2
	Jul 2	2.9	4.2
	8	3.3	3.3
	15	3.5	2.3
	24	3.7	2.4
	29	3.0	2.4
	Aug 7	3.7	1.6
	Sep 2	3.7	2.7
	9	3.8	2.3
	15	<u>3.5</u>	<u>3.3</u>
	MEAN	3.39	3.02
	STANDARD DEVIATION	0.33	0.85
<u>Sharbot</u> Hawley Bay	Jun 12	3.2	2.8
	18	3.5	4.5
	26	---	3.5
	Jul 2	3.0	5.4
	8	3.7	6.2
	15	3.7	2.8
	24	3.8	2.5
	29	3.5	3.4
	Aug 7	3.8	2.3
	Sep 2	3.8	2.1
	9	4.0	1.9
	15	<u>3.7</u>	<u>2.6</u>
	MEAN	3.61	3.33
	STANDARD DEVIATION	0.29	1.36
<u>Sharbot</u> McCrimmon Bay	Jun 12	3.5	3.3
	18	3.5	4.1
	26	---	3.5
	Jul 2	3.2	4.7
	8	3.7	3.1
	15	3.7	3.3
	24	4.0	2.3
	29	3.7	3.1
	Aug 7	4.0	2.8
	Sep 2	4.0	2.9
	9	4.1	2.0
	15	<u>3.8</u>	<u>3.0</u>
	MEAN	3.75	3.18
	STANDARD DEVIATION	0.27	0.72

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Sharbot</u> West Basin	May	28	4.6	3.2
	Jun	12	3.7	3.3
		24	4.3	2.4
	Jul	11	4.0	1.6
		25	4.6	1.9
	Aug	14	4.3	2.7
		22	4.3	2.4
	Sep	5	<u>4.9</u>	<u>1.4</u>
	MEAN		4.34	2.36
	STANDARD DEVIATION		0.37	0.70
87. <u>Silver</u> East	Jun	21	2.9	2.4
	Jul	3	3.0	2.1
		11	3.0	1.6
		15	3.7	1.7
		25	3.7	3.4
	Aug	3	4.7	10.2
		9	3.7	1.9
		10	2.7	1.8
		28	3.2	2.0
	Sep	8	3.7	1.8
		14	3.5	2.4
		21	3.4	1.9
	Oct	7	3.5	1.2
		14	<u>3.6</u>	<u>2.2</u>
	MEAN		3.45	2.61
	STANDARD DEVIATION		0.49	2.24
<u>Silver</u> West	Jun	21	3.2	2.5
	Jul	3	2.9	3.2
		11	2.9	1.6
		15	3.4	2.2
		25	3.7	1.8
	Aug	3	4.6	3.7
		9	3.7	2.1
		18	2.8	1.7
		28	3.2	1.8
	Sep	8	3.8	1.6
		14	3.6	2.1
		21	3.7	2.2
	Oct	7	3.5	1.1
		14	<u>3.7</u>	<u>2.4</u>
	MEAN		3.48	2.14
	STANDARD DEVIATION		0.47	0.67
<u>Silver</u> Mid Lake	Jun	21	3.0	3.0
	Aug	13	2.5	2.4
88. <u>Skootamatta</u> Upper Lake	Jul	13 (Jacks Bay)	3.4	2.8
	Aug	3	3.4	2.4
		10	4.4	1.5
	Sep	11	3.5	1.7

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Skootamatta</u> <u>Lower Lake</u>	Jul	13 (Sheldrake Bay)	3.5	---
		13	3.4	3.0
	Aug	3	3.4	2.4
		10	4.4	1.5
	Sep	11	<u>3.4</u>	<u>2.0</u>
	MEAN		3.64	2.23
	STANDARD DEVIATION		0.43	0.63
89. <u>Smith</u>	Jul	22	4.5	4.1
	Aug	10	4.4	7.6
		18	4.3	3.9
		21	<u>4.1</u>	<u>3.5</u>
	MEAN		4.33	4.78
	STANDARD DEVIATION		0.17	1.90
90. <u>Sydenham</u>	Jul	20	5.5	2.8
		27	4.1	3.6
	Aug	4	3.8	3.3
		10	4.4	3.7
		16	4.1	3.3
		24	4.3	3.4
	Sep	1	3.4	2.1
		7	<u>4.4</u>	<u>3.0</u>
	MEAN		4.25	3.15
	STANDARD DEVIATION		0.61	0.52
91. <u>Taylor</u>	Jul	9	2.5	3.1
92. <u>Temperance</u>	Jun	29	2.7	2.9
	Jul	6	2.6	5.0
		13	2.1	6.6
		20	1.8	6.8
		28	2.0	8.8
	Aug	4	1.8	8.7
		10	1.8	7.5
		17	1.5	5.0
		24	1.8	5.3
	Sep	1	1.7	5.6
		7	1.7	6.5
		21	<u>1.5</u>	<u>3.7</u>
	MEAN		1.92	6.03
	STANDARD DEVIATION		0.38	1.81
93. <u>Thirty Island</u>	May	4	3.5	2.2
	Jun	8	5.6	2.6
		22	5.3	4.0
	Jul	1	5.3	3.3
		6	4.9	2.2
		12	4.9	2.3
		21	4.7	2.4

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
<u>Thirty Island</u> (cont'd)	Aug	2	4.6	5.5
		10	5.2	2.9
		16	4.6	3.4
		24	4.6	3.1
	Sep	1	3.8	3.0
		22	4.0	10
	Nov	2	<u>3.5</u>	<u>3.0</u>
	MEAN		4.61	3.56
	STANDARD DEVIATION		0.68	2.04
94. <u>Troy</u>	May	4	2.4	7.0
		11	2.4	4.4
		25	3.2	4.0
	Jun	1	2.7	4.5
		8	2.6	5.8
		15	2.6	5.5
		22	3.2	4.5
	Jul	1	2.7	5.4
		6	2.7	4.1
		13	3.0	2.7
		20	2.3	4.5
	Aug	4	2.1	7.4
		8	2.1	9.0
		25	2.0	9.4
		26	2.0	10.2
	Sep	31	1.8	11.1
		7	1.5	9.2
	Nov	28	1.5	13
		2	1.8	6.8
		15	<u>1.8</u>	<u>5.9</u>
	MEAN		2.32	6.72
	STANDARD DEVIATION		0.52	2.76
95. <u>Verona</u> (Rock)	May	19	4.9	1.8
	Jun	21	3.0	2.6
		27	<u>3.2</u>	<u>2.5</u>
	MEAN		3.70	2.30
	STANDARD DEVIATION		1.04	0.44
96. <u>Watson</u>	Jun	16	2.0	13
		23	1.9	8.5
	Jul	9	1.6	16
		30	1.7	5.2
	Aug	7	1.6	4.9
		13	1.4	10.2
		28	1.1	7.0
	Sep	7	<u>0.8</u>	<u>36</u>
	MEAN		1.51	12.60
	STANDARD DEVIATION		0.40	10.19

LAKE	DATE	SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
97. <u>White</u> #1	Jun 12	2.9	32
	19	3.0	---
	25	2.7	2.3
	Jul 2	3.2	3.0
	9	3.0	3.4
	16	3.2	2.6
	24	2.4	3.2
	31	2.4	1.8
	Aug 7	2.4	3.7
	13	2.4	5.5
	20	2.3	6.8
	28	2.0	5.8
	Sep 3	1.7	9.1
	11	1.8	5.3
	24	2.4	7.3
	Oct 1	2.0	3.4
	8	2.4	1.7
	15	3.0	4.3
	22	3.8	1.8
	Oct 30	<u>3.2</u>	<u>2.1</u>
MEAN		2.61	5.53
STANDARD DEVIATION		0.54	6.74
<u>White</u> #2	Jun 12	3.0	6.3
	19	3.0	4.4
	25	3.0	2.1
	Jul 2	3.5	---
	9	3.4	3.3
	16	3.0	2.0
	24	3.4	2.4
	31	3.0	1.9
	Aug 7	3.2	4.0
	13	2.4	5.9
	20	2.3	8.7
	28	2.3	5.0
	Sep 3	1.7	12.3
	11	1.7	15
	24	1.7	12
	Oct 1	1.8	3.9
	8	2.3	2.0
	15	3.5	3.7
	22	4.1	1.6
	30	<u>5.0</u>	<u>1.2</u>
MEAN		2.87	5.14
STANDARD DEVIATION		0.86	4.04

LAKE	DATE		SECCHI DISC (m)	CHLOROPHYLL <u>a</u> (ug/l)
98. <u>Whitefish</u> A	May	11	2.4	---
		19	2.7	2.5
		25	4.0	2.1
	Jun	22	3.4	4.4
	Jul	7	3.0	2.5
		13	2.7	2.4
		21	2.7	3.6
	Aug	30	2.1	3.4
		17	1.2	7.6
		1	1.5	5.4
	Sep	28	3.0	3.9
	MEAN		2.61	3.78
	STANDARD DEVIATION		0.80	1.69
<u>Whitefish</u> B(Morton Bay)	May	11	2.4	3.4
		19	3.0	2.2
		25	3.7	2.3
	Jun	22	3.0	6.2
	Jul	7	2.7	4.3
		13	2.7	3.1
		21	3.0	4.2
	Aug	30	2.1	5.1
		17	1.4	11.0
		1	1.5	6.9
	Sep	28	3.0	5.0
	MEAN		2.59	4.88
	STANDARD DEVIATION		0.69	2.52
99. <u>Wollaston</u>	Aug	11	5.8	1.5
		22	5.6	1.4
	Sep	8	5.3	1.1
		18	---	0.9
	Oct	1	5.5	0.7
		14	5.0	1.4
	MEAN		5.44	1.17
	STANDARD DEVIATION		0.30	0.32

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